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1. About this document

1.1. Scope

These operating instructions are valid for all MGB-L..B-PN-... (PROFINET) with Data Structure Type A and the following order numbers:

105283	109856	113230	113233	115621	121843
105284	109857	113231	114775	115622	121845
105287	110816	113232	114776	121841	121847

These operating instructions, the document "Safety information and maintenance" and any enclosed data sheet form the complete user information for your device.

Series	Guard locking types	System families	Product versions
MGB	L0 (without guard locking)	...-PN...	from V3.30.1
	L1 (guard locking by spring force)		from V3.30.1
	L2 (guard locking by solenoid force)		from V3.30.0






1.1.1. Notes on older product versions

Products with lower product versions or without a version number are not described by these operating instructions. Please contact our support team in this case.

1.2. Target group




Design engineers and installation planners for safety devices on machines, as well as setup and servicing staff possessing special expertise in handling safety components

1.3. Key to symbols

Symbol/depiction	Significance
	Printed document
	Document is available for download at www.EUCHNER.de
	Document on CD
 DANGER WARNING CAUTION	Safety precautions Danger of death or severe injuries Warning about possible injuries Caution Slight injuries possible
 NOTICE Important!	Notice about possible device damage Important information
Tip	Tip/useful information

1.4. Supplementary documents

The overall documentation for this device consists of the following documents:

Document title (document number)	Contents	
Operating instructions (114575)	(this document)	
Possibly enclosed data sheet	Item-specific information about deviations or additions	
	Important! Always read all documents to gain a complete overview of safe installation, setup and use of the device. The documents can be downloaded from www.euchner.de . Enter the document number in the search box for this purpose.	

2. Correct use

The following applies to MGB-L0:

The system comprises at least one interlocking module MGB-L0-... and one handle module MGB-H...

The safety system MGB is an interlocking device without guard locking (type 4). Devices with unicode evaluation possess a high coding level; devices with multicode evaluation feature a low coding level.

In combination with a movable safety guard and the machine control, this safety component prevents dangerous machine functions from occurring while the safety guard is open. A stop command is triggered if the safety guard is opened during the dangerous machine function.

This means:

- Starting commands that cause a dangerous machine function must become active only when the safety guard is closed.
- Opening the safety guard triggers a stop command.
- Closing a safety guard must not cause automatic starting of a dangerous machine function. A separate start command must be issued. For exceptions, refer to EN ISO 12100 or relevant C-standards.

The following applies to MGB-L1/MBG-L2:

The system comprises at least one locking module MGB-L1-.../MGB-L2-... and one handle module MGB-H...

The safety system MGB is an interlocking device with guard locking (type 4). Devices with unicode evaluation possess a high coding level; devices with multicode evaluation feature a low coding level.

In combination with a movable safety guard and the machine control, this safety component prevents the safety guard from being opened while a dangerous machine function is being performed.

This means:

- Starting commands that cause a dangerous machine function must become active only when the safety guard is closed and locked.
- The guard locking device must not be unlocked until the dangerous machine function has ended.
- Closing and locking a safety guard must not cause automatic starting of a dangerous machine function. A separate start command must be issued. For exceptions, refer to EN ISO 12100 or relevant C-standards.

For MGB-L0 /MGB-L1 / MGB-L2

The interlocking module MGB-LOB-PN-... and the locking module MGB-L1B-PN-.../MGB-L2B-PN-... are operated as IO devices in the PROFINET (PROFIsafe).

Before the device is used, a risk assessment must be performed on the machine, e.g. in accordance with the following standards:

- EN ISO 13849-1, Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
- EN ISO 12100, Safety of machinery – General principles for design – Risk assessment and risk reduction
- IEC 62061, Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems

Correct use includes observing the relevant requirements for installation and operation, particularly based on the following standards:

- EN ISO 13849-1, Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design
- EN ISO 14119 (supersedes EN 1088), Safety of machinery – Interlocking devices associated with guards – Principles for design and selection
- EN 60204-1, Safety of machinery – Electrical equipment of machines – Part 1: General requirements

The safety system MGB can only be combined with the intended modules in the MGB system family.

On the modification of system components, EUCHNER provides no warranty for function.

The customer is responsible for the safe overall function, especially for the safe integration into the PROFIsafe environment.



Important!

- › The user is responsible for the proper integration of the device into a safe overall system. For this purpose, the overall system must be validated, e.g. in accordance with EN ISO 13849-2.
- › Correct use requires observing the permissible operating parameters (see chapter 17. *Technical data on page 34*).
- › If a product data sheet is included with the product, the information on the data sheet applies in case of discrepancies with the operating instructions.

Table 1: Possible combinations for MGB components

Evaluation unit	Handle module	
	MGB-H-... from V2.0.0	
MGB...PN from V3.30.0	●	
Key to symbols	●	Combination possible

3. Description of the safety function

Devices from this series feature the following safety functions:

The following applies in case of active guard lock monitoring (ÜK, bit SI 10):

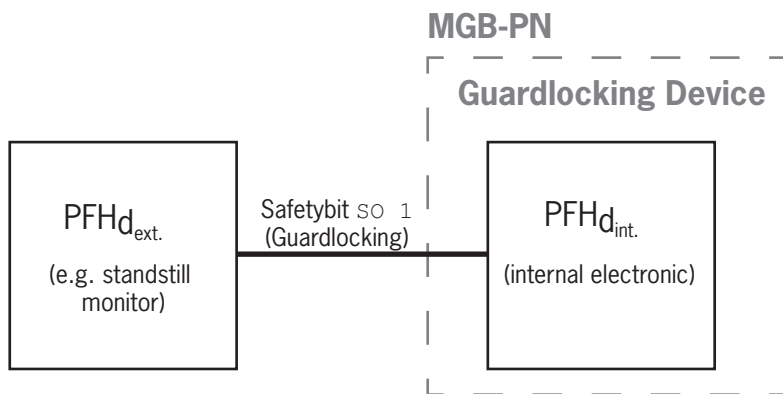
**Monitoring of guard locking and the position of the safety guard
(interlocking device with guard locking according to EN ISO 14119)**

- › Safety function (see chapter 6. *Function on page 10*):
 - When guard locking is unlocked, safety bit SI 10 (ÜK) = 0 (monitoring of the locking device).
 - When the safety guard is open, safety bit SI 9 (SK) = 0.
 - Guard locking can be activated only when the bolt tongue is located in the locking module (failsafe locking mechanism).
- › Safety characteristics: category, Performance Level, PFH_d (see chapter 17. *Technical data on page 34*).

Control of guard locking (safety bit SO 1)

- › Safety function.
If the device is used as guard locking for personnel protection, control of guard locking must be regarded as a safety function.

The safety level of guard locking control is determined by the device PFH_{d int.} and by the external control (e.g. PFH_{d ext.} of the standstill monitor).



- › Safety characteristics: category, Performance Level, PFH_d (see chapter 17. *Technical data on page 34*).

The following applies in case of inactive guard lock monitoring (ÜK, bit SI 10):

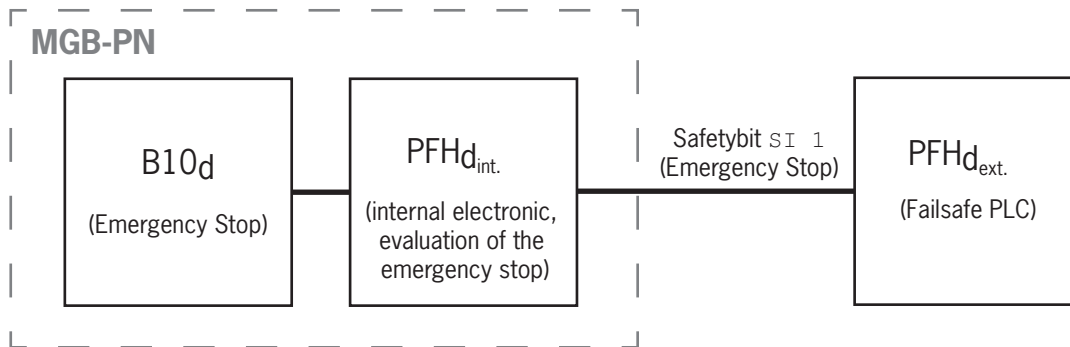
**Monitoring of the safety guard position
(interlocking device according to EN ISO 14119)**

- › Safety function: When the safety guard is open, safety bit SI 10 (SK) = 0 (see chapter 6. *Function on page 10*).
- › Safety characteristics: category, Performance Level, PFH_d (see chapter 17. *Technical data on page 34*).

The following applies to devices with emergency stop:

Emergency stop
(emergency stop device according to EN ISO 13850)

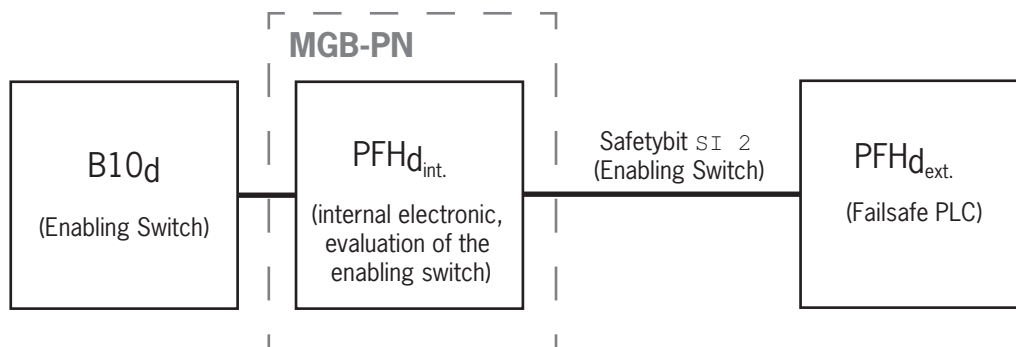
- › Safety function: evaluation of emergency stop
- › Safety characteristics: B_{10d} value of emergency stop and PFH_d for the evaluation electronics (see chapter 17. Technical data on page 34)



The following applies to devices with connection for enabling switch:

Enabling function

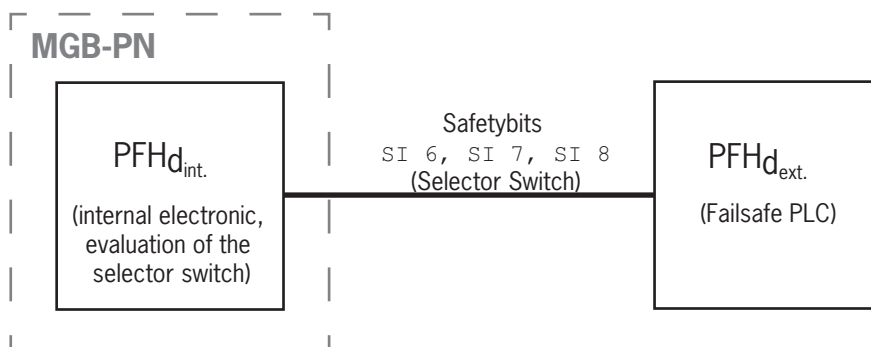
- › Safety function: evaluation of a connected enabling switch
- › Safety characteristics: B_{10d} value of the enabling switch (see manufacturer's information) and PFH_d for the evaluation electronics (see chapter 17. Technical data on page 34)



For devices with selector switch:

Detection of the switch position

- › Safety function: evaluation of the switch position, e.g. for safe switchover between individual operating modes
- › Safety characteristics: PFH_d for the evaluation electronics (see chapter 17. Technical data on page 34). The switch position is scanned electronically, so there is no B_{10d} value for the switch.



4. Exclusion of liability and warranty



In case of failure to comply with the conditions for correct use stated above, or if the safety instructions are not followed, or if any servicing is not performed as required, liability will be excluded and the warranty void.

5. General safety instructions

Safety switches fulfill personal protection functions. Incorrect installation or tampering can lead to fatal injuries to personnel. Check the safe function of the safety guard particularly

- › after any setup work
- › after the replacement of an MGB component
- › after an extended period without use
- › after every fault
- › after any change to the DIP switch setting

Independent of these checks, the safe function of the safety guard should be checked at suitable intervals as part of the maintenance schedule.

	<p>WARNING</p> <p>Danger to life due to improper installation or due to bypassing (tampering). Safety components perform a personal protection function.</p> <ul style="list-style-type: none">› Safety components must not be bypassed, turned away, removed or otherwise rendered ineffective. On this topic pay attention in particular to the measures for reducing the possibility of bypassing according to EN ISO 14119:2013, section 7.› The switching operation is only allowed to be triggered by the intended handle module MGB-H... that is positively fastened to the safety guard.› Prevent bypassing by means of replacement actuators (only for multicode evaluation). For this purpose, restrict access to actuators and to keys for releases, for example.› Mounting, electrical connection and setup only by authorized personnel possessing the following knowledge:<ul style="list-style-type: none">- specialist knowledge in handling safety components- knowledge about the applicable EMC regulations- knowledge about the applicable regulations on occupational safety and accident prevention.
	<p>Important!</p> <p>Prior to use, read the operating instructions and keep these in a safe place. Ensure the operating instructions are always available during mounting, setup and servicing. EUCHNER cannot provide any warranty in relation to the readability of the CD for the storage period required. For this reason you should archive a printed copy of the operating instructions. You can download the operating instructions from www.euchner.de.</p>

6. Function

6.1. Interlocking module MGB-L0.B-PN.

Together with a handle module, the interlocking module makes it possible to interlock moving safety guards. The combination also serves as a mechanical door stop at the same time.

The following switch-on condition applies to safety bit $SI\ 9$ (SK):

- › Safety guard closed (T)
- › Bolt tongue inserted into interlocking module (R)

See also chapter 16. *System status table on page 33* and chapter 13.8. *PROFIsafe data bytes (data block for safe functions) on page 30*.

The interlocking module detects the position of the safety guard and the position of the bolt tongue.

The bolt tongue in the handle module is moved into and out of the interlocking module by actuating the door handle.

6.2. Locking module MGB-L1.B-PN. and MGB-L2.B-PN.

Together with a handle module, the locking module makes it possible to lock moving safety guards. The combination also serves as a mechanical door stop at the same time.



Important!

To operate the device as a guard lock for personnel protection according to EN ISO 14119, the signals for door position (T=PROFIsafe bit $SI\ 3$), bolt position (R= PROFIsafe bit $SI\ 4$) and guard lock monitoring (Z= PROFIsafe bit $SI\ 5$) must be polled in a logical AND operator. This operator is already implemented in the PROFIsafe data block (ÜK=safety bit $SI\ 10$).

As an alternative, you can also link the bits $SI\ 3$ to $SI\ 5$ individually in your control system.

The following switch-on condition applies to safety bit $SI\ 10$ (ÜK):

- › Safety guard closed (T)
- › Bolt tongue inserted into locking module (R)
- › Locking arm in locking position (guard lock monitoring) (Z)

See also chapter 16. *System status table on page 33* and chapter 13.8. *PROFIsafe data bytes (data block for safe functions) on page 30*.

The locking module detects the position of the safety guard and the position of the bolt tongue. The position of the locking arm is also monitored.

The bolt tongue in the handle module is moved into and out of the locking module by actuating the door handle.

When the bolt tongue is fully inserted in the locking module, the locking arm locks the bolt tongue in this position. Depending on the version, this locking is by spring force or solenoid force.

6.3. Guard locking for version MGB-L1

(guard locking actuated by spring force and released by energy ON)

Activating guard locking: close safety guard; no voltage at the solenoid (safety bit $so\ 1 = 0$).

Releasing guard locking: apply voltage to the solenoid (safety bit $so\ 1 = 1$).

The spring-operated guard locking functions in accordance with the closed-circuit current principle. If voltage is interrupted at the solenoid, guard locking remains active and the safety guard cannot be opened directly.



Important!

If the safety guard is open when the power supply is interrupted and the guard is then closed, guard locking is activated. This can lead to persons being locked in unintentionally.

As long as the locking arm is closed, the bolt tongue cannot be pulled out of the locking module and the safety guard is locked.

When voltage is applied to the locking solenoid, the locking arm is opened and bolt tongue is released. The safety guard can be opened.

6.4. Guard locking for version MGB-L2

(guard locking actuated by energy ON and released by spring force)



Important!

Use as guard locking for personnel protection is possible only in special cases, after strict assessment of the accident risk (see EN ISO 14119:2013, section 5.7.1)!

Activating guard locking: apply voltage to the solenoid (safety bit $so\ 1 = 1$).

Releasing guard locking: disconnect voltage from the solenoid (safety bit $so\ 1 = 0$).

The magnetically actuated guard locking operates in accordance with the open-circuit current principle. If voltage is interrupted at the solenoid, guard locking is released and the safety guard can be opened directly!

The safety guard can be opened as long as no voltage is applied to the guard locking solenoid.

When voltage is present at the guard locking solenoid, the the locking arm is held in locked position and the safety guard is locked.

6.5. Control of the guard locking

From MGB version V2.36.4, the factory ensures that control is possible only from the safe control area.

By changing the parameters in the configuration tool of your control system, it can be set whether bit $\circ 16$ (in the safe data block for the MGB locking module) is evaluated as well.



Important!

The following applies to MGB-L2:

Control of the guard locking via the safe control area does not provide increased safety, as the device-internal control of the guard locking is only of single-channel design.



Important!

The following functions depend on the MGB version, the version of the GSD file and the settings made there.

Compare the specified versions with those on your device and your GSD file. The version number of your MGB can be found on the type plate (format: VX.XX.X).

MGB version	GSD version	Continue in section ...
up to and including V2.35.4	..._110026- 20110725	Case A
	..._110026- 20110815	Case A
from V3.30.0	..._110026- 20110725	Case B
	..._110026- 20110815 or newer	Case C

6.5.1. Case A

You have an MGB with a version number of V2.35.4 and a GSD file with a version number of ..._110026-20110725 or older. Or you have an MGB with a version number of V2.35.4 and a GSD file with a version number from ..._110026-20110815.

The guard locking solenoid is controlled if

▸ bit $\circ 16$ **OR** bit $\text{SO } 01 = 1$

Truth table

PROFINET bit $\circ 16$	PROFIsafe bit $\text{SO } 01$	Guard locking with	
		MGB-L1...	MGB-L2...
0	0	active	inactive
0	1	inactive	active
1	0	inactive	active
1	1	inactive	active

What must be observed?

The guard locking can be controlled from the unsafe control area. The combination with the more up-to-date GSD file allows a parameter to specify which bits are to be used for control. However, the device does not support this function. In other words, the setting in your configuration software remains ineffective.

6.5.2. Case B

You have an MGB with a version number of V3.30.0 and a GSD file with a version number of ..._110026-20110725 or older.

The guard locking solenoid is controlled if

for MGB-L1...

▸ bit SO 01 = 1

for MGB-L2...

▸ bit O 16 **OR** bit SO 01 = 1

Truth table

PROFINET bit O 16	PROFIsafe bit SO 01	Guard locking with	
		MGB-L1...	MGB-L2...
0	0	active	inactive
0	1	inactive	active
1	0	active	active
1	1	inactive	active

What must be observed?

Bit O 16 does not have any function with version MGB-L1.... In existing installations in which old devices are replaced with new ones (e.g. due to defect), malfunctions can occur if control via bit O 16 was programmed in the PLC.

Remedy:

1. Replace the old GSD file with a version from ..._110026-20110815.
2. In the parameter *Locking module – solenoid control*, activate unsafe control of the guard locking solenoid via bit O 0.0.
3. Set bit SO 01 permanently to the value 1.

➡ The guard locking solenoid is controlled exclusively via bit O 16

or

▸ Change the control bit from O 16 to SO 01 in your PLC program.

6.5.3. Case C

You have an MGB with a version number of V3.30.0 and a GSD file with a version number from ..._110026-20110815.

The guard locking solenoid is controlled if:

▸ bit SO 01 = 1 (factory setting)

Truth table

PROFINET bit O 16 irrelevant	PROFIsafe bit SO 01	Guard locking with	
		MGB-L1...	MGB-L2...
0	0	active	inactive
0	1	inactive	active
1	0	active	inactive
1	1	inactive	active

What must be observed?

You can define in the GSD file whether bit O 16 may be used for control in addition to bit SO 01. The setting is specified in the parameter *Locking module – solenoid control*.

If O 16 is additionally used, the guard locking solenoid is controlled if
for MGB-L1...

▸ bit SO 01 **AND** bit O 16 = 1

for MGB-L2...

▸ bit SO 01 **OR** bit O 16 = 1

Truth table

PROFINET bit O 16	PROFIsafe bit SO 01	Guard locking with	
		MGB-L1...	MGB-L2...
0	0	active	inactive
0	1	active	active
1	0	active	active
1	1	inactive	active

7. System overview

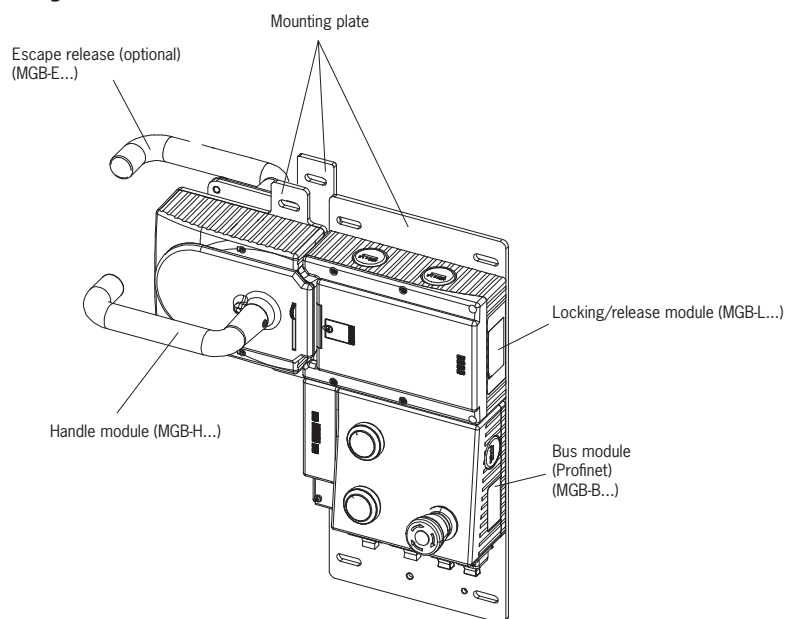


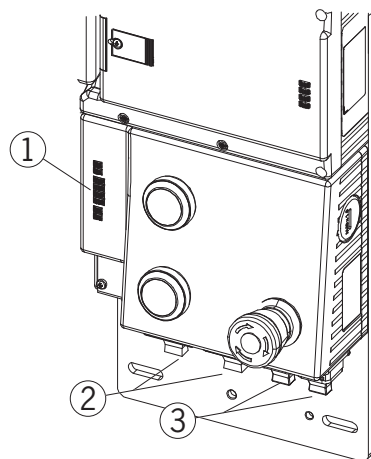
Figure 1: Components at a glance



NOTICE

MGB-PN systems are completely factory configured. The configuration must not be changed subsequently. The illustrations in this chapter can deviate from your system and serve only as examples. The configuration of your MGB system can be found in the data sheet included with every MGB system.

7.1. Bus module MGB-B-...-PN



Key:

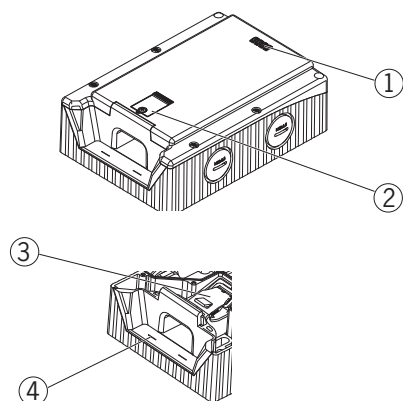
- ① LED indicator
- ② Power supply
- ③ PROFINET connection

Notice:

Depending on the version, additional controls and indicators may be integrated into the cover. See enclosed data sheet.

Figure 2: Bus module MGB-B-...-PN (configuration example)

7.2. Locking/release module MGB-L.-



Key:

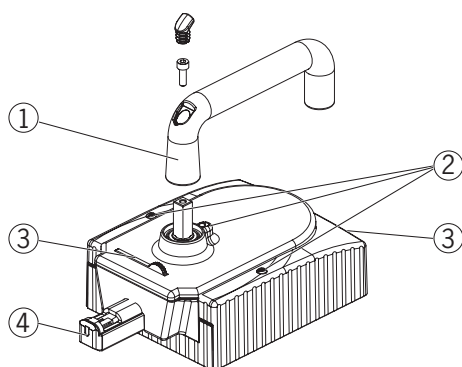
- ① LED indicator
- ② Cover for mechanical release
- ③ Locking arm (only for version with guard locking)
- ④ Auxiliary marking for max. permitted mounting distance

Notice:

Depending on the version, additional controls and indicators may be integrated into the cover. See enclosed data sheet.

Figure 3: Locking/release module MGB-L.-

7.3. Handle module MGB-H-...



Key:

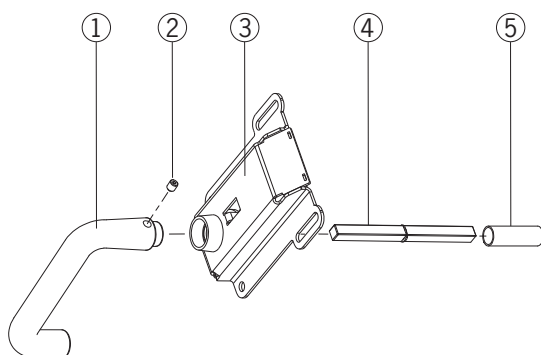
- ① Door handle
- ② Locking screws T10 for housing cover and handle adjustment
- ③ Fold-out lockout mechanism (optional: second, automatically extending lockout mechanism)
- ④ Bolt tongue

Notice:

Depending on the version, a mounting plate can be included. See enclosed data sheet.

Figure 4: Handle module MGB-H-...

7.4. Escape release MGB-E-... (optional)



Key:

- ① Door handle
- ② Setscrew
- ③ Cover
- ④ Actuation axis 8 x 8 mm (different lengths available)
- ⑤ Protective sleeve

Notice:

Depending on the version, a mounting plate can be included. See enclosed data sheet.

Figure 5: Escape release MGB-E-...

7.5. Dimension drawing

See enclosed data sheet.

7.6. Manual release

Some situations require guard locking to be released manually (e.g. malfunctions or an emergency). A function test should be performed after release.

More information on this topic can be found in the standard EN ISO 14119:2013, section 5.7.5.1. The device can feature the following release functions:

7.7. Mechanical release

In the event of service, the guard locking can be released with the mechanical release irrespective of the state of the solenoid (see Figure 6).

i	<p>Important!</p> <ul style="list-style-type: none"> ▸ The system enters into a latching fault when the mechanical release is actuated. See <i>System status table, signal sequence incorrect</i> status (DIA red, Lock flashes 1 time). ▸ The system might not enter into a latching fault if the mechanical release is actuated very slowly.
i	<p>Important!</p> <ul style="list-style-type: none"> ▸ The mechanical release is not a safety function. ▸ The machine manufacturer must select and use a suitable release (escape release, emergency unlocking, etc.) for a specific application. A risk assessment is required for this purpose. It may be necessary to take specifications from a product standard into account. ▸ The correct function must be checked at regular intervals. ▸ Loss of the release function due to mounting errors or damage during mounting. Check the release function every time after mounting. ▸ Please observe the notes on any enclosed data sheets.

The locking screw must be screwed back in and sealed (for example with sealing lacquer) after assembly and after every use of the mechanical release. Tightening torque 0.5 Nm.

1. Undo locking screw.
2. Lift locking arm using a screwdriver and actuate door handle.

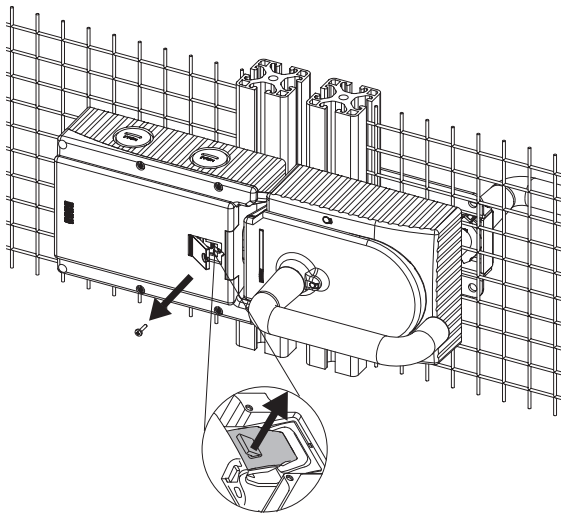


Figure 6: Mechanical release

7.8. Lockout mechanism

If the lockout mechanism is pivoted out/extended, the bolt tongue cannot be extended. The lockout mechanism can be secured with padlocks (see Figure 7). This is intended to prevent people from being locked in unintentionally. The lockout mechanism does not fulfill any safety function.

➔ To pivot out, press the grooved part (only possible with bolt tongue retracted).

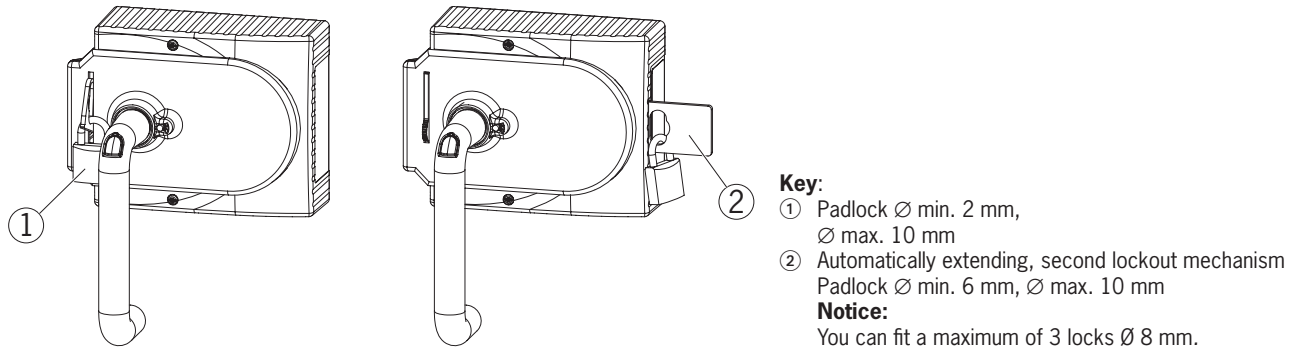


Figure 7: Lockout mechanism secured with padlock

7.9. Escape release (optional)

The escape release is used to open a locked safety guard from the inside without tools.

The system enters into a latching fault when the escape release is actuated.

See chapter 16. *System status table on page 33, signal sequence incorrect status (DIA red, Lock flashes 1 time).*

The system might not enter into a latching fault if the escape release is actuated very slowly.



Important!

- › It must be possible to operate the escape release manually from inside the protected area without tools.
- › It must not be possible to reach the escape release from the outside.
- › The actuator must not be under tensile stress during manual release.
- › The escape release meets the requirements of Category B according to EN ISO 13849-1:2008.
- › The correct function must be checked at regular intervals.
- › Please observe the notes on any enclosed data sheets.

- › Fit escape release such that operation, inspection and service are possible.
- › The actuation axis for the escape release must be inserted min. 10 mm into the handle module. Note the information on the different profile widths in the chapter 7.9.1. *Preparing escape release on page 19.*
- › Align escape release axis at right angles to the handle module. See Figure 8.

7.9.1. Preparing escape release

Profile width	Length required for actuation axis		Which EUCHNER parts are required?	Necessary work steps
	Without plates	With mounting plates (4 mm each)		
D	D+13	D+21		
30 mm	43 mm	51 mm	Standard escape release with 110 mm axis (order no. 100465)	Shorten to required length
40 mm	53 mm	61 mm	Standard escape release with 110 mm axis (order no. 100465) If necessary extended actuation axis (order no. 106761)	Without mounting plates: None With mounting plates: Use long actuation axis and protective sleeve and shorten to required length
45 mm	58 mm	66 mm	Standard escape release with 110 mm axis (order no. 100465) and extended actuation axis (order no. 106761)	Use long actuation axis and protective sleeve and shorten to required length
50 mm	63 mm	71 mm	Standard escape release with 110 mm axis (order no. 100465) and extended actuation axis (order no. 106761)	Use long actuation axis and protective sleeve and shorten to required length

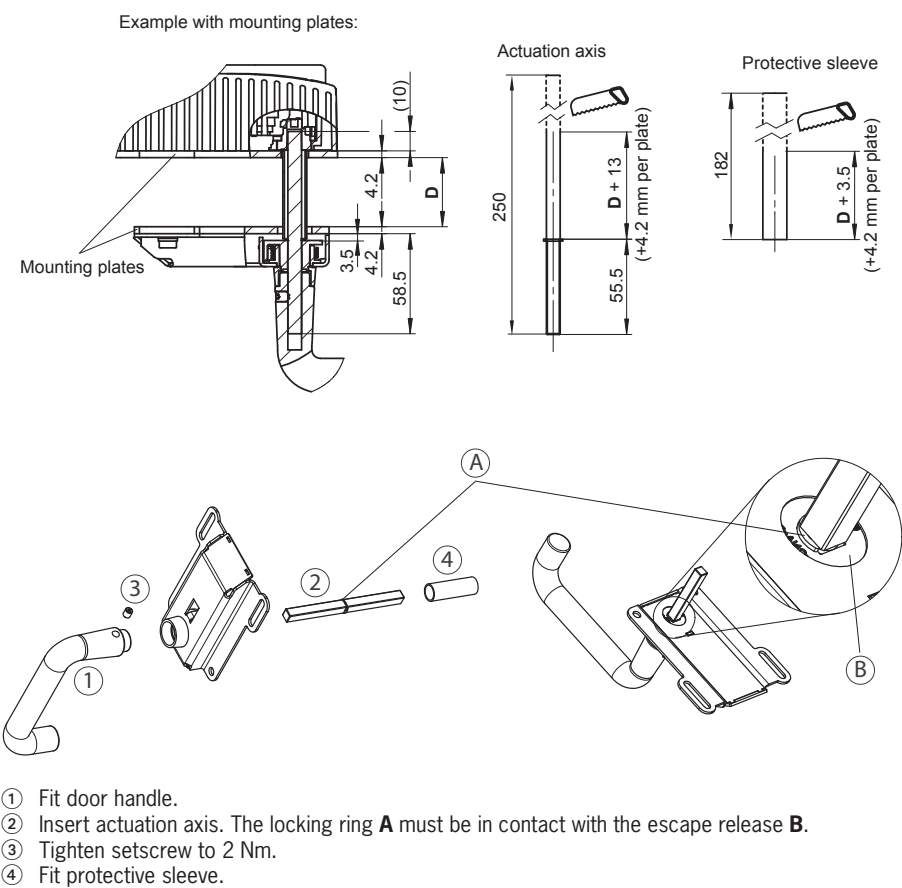


Figure 8: Preparing escape release

8. Mounting



WARNING

Mounting must be performed only by authorized personnel.

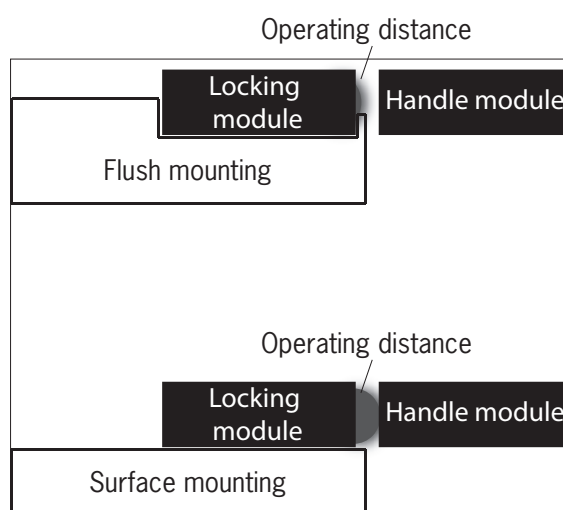
With two-wing hinged doors, one of the two door wings additionally must be latched mechanically.

Use a rod latch (Item) or a double-door lock (Bosch Rexroth) for this purpose, for example.



Important!

- If installed flush, the switching distance changes as a function of the installation depth and the safety guard material.



Tip!

- You can find an animation on the mounting process at www.mgb.euchner.de.
- The color and labeling of pushbuttons and indicators can be modified.

For mounting steps, see *Figure 9* and *Figure 10* to *Figure 15*.

Attach system such that operation of the mechanical release as well as inspection and maintenance are possible.

The locking screw of the escape release must be returned to its original position and sealed before putting into operation (for example with sealing lacquer).

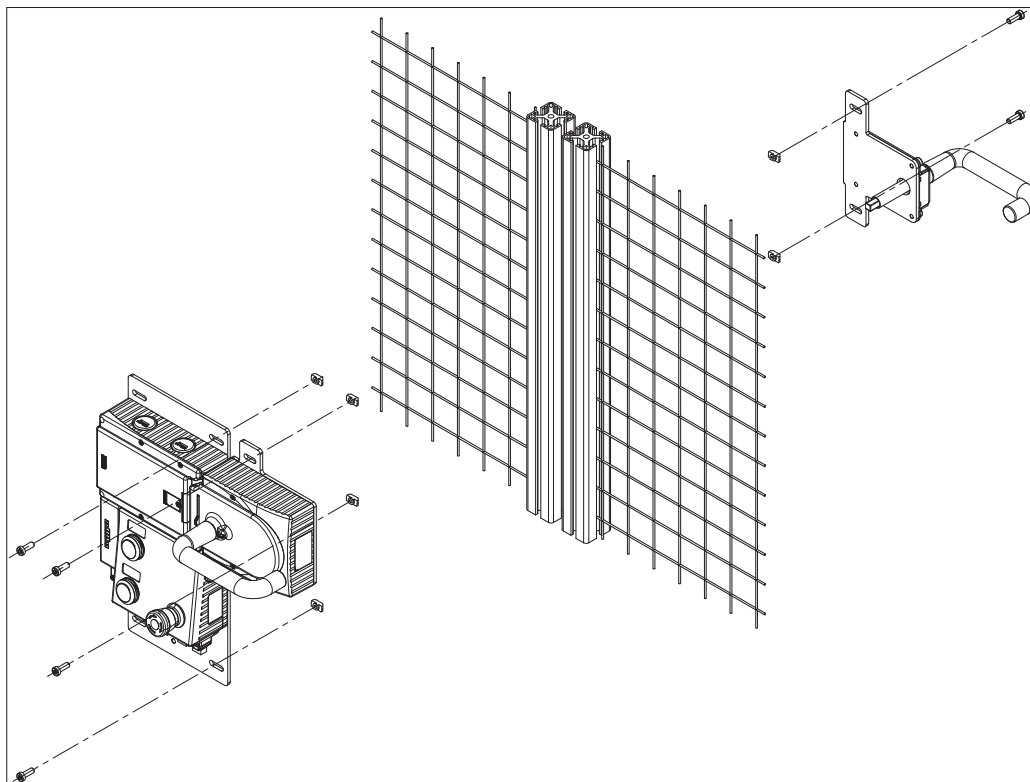
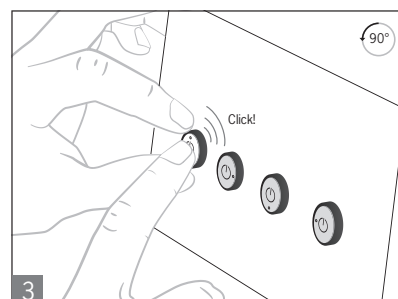
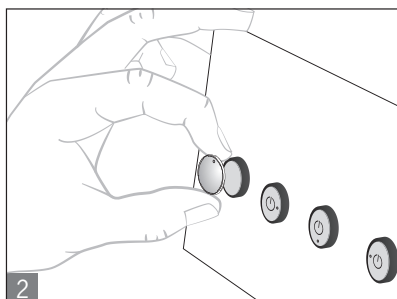
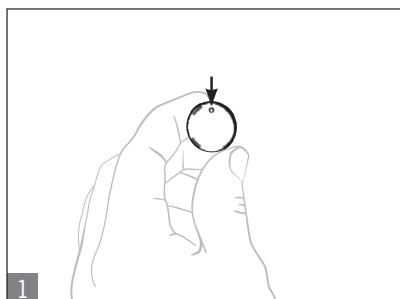


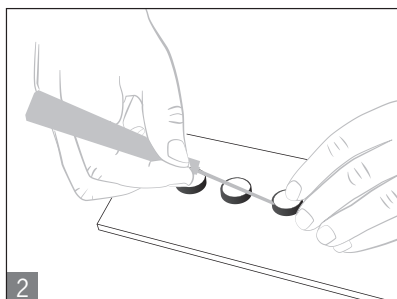
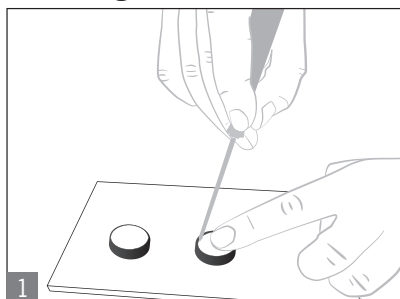
Figure 9: Installation example for door hinged on the right (general view)

8.1. Mounting color cover

Mounting



Removing



Color cover

9. Changing actuating direction

(here: from right to left)



Important!

It is only possible to make this change when the bolt tongue is not extended and an escape release is not yet mounted.

As supplied, the handle module is set either for doors hinged on the right or for doors hinged on the left.

Based on the example of a handle module for doors hinged on the right this means:

- The safety guard opens by pressing down the door handle.
- The system is mounted the other way around for doors hinged on the left. In other words, the safety door opens by pressing up the door handle (see Figure 10). For this reason the actuating direction of the door handle must be changed (see Figure 10 to Figure 15).

(Similarly on handle modules for doors hinged on the left)

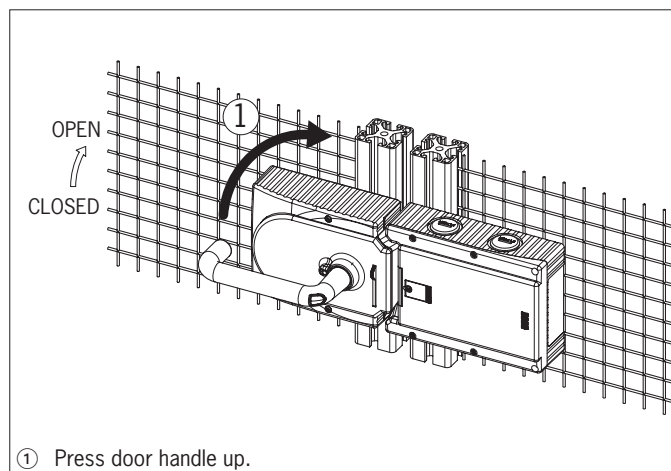


Figure 10: Changing actuating direction, step ①

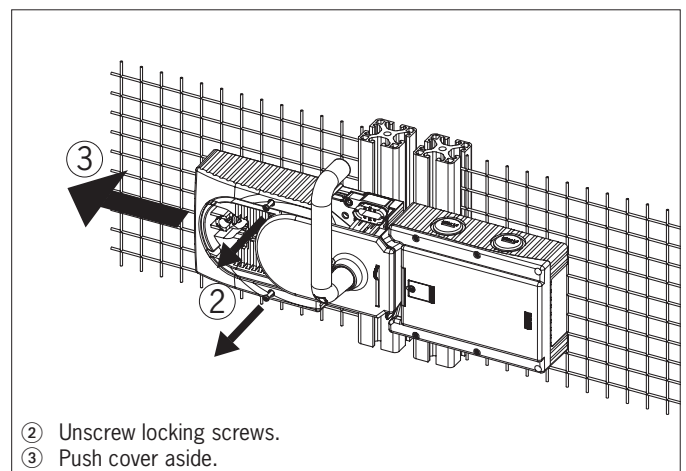


Figure 11: Changing actuating direction, steps ② and ③

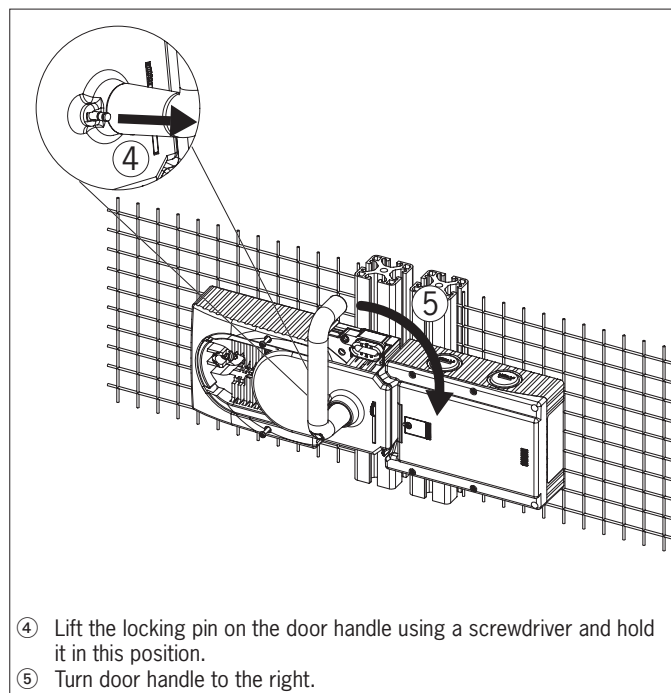


Figure 12: Changing actuating direction, steps ④ and ⑤

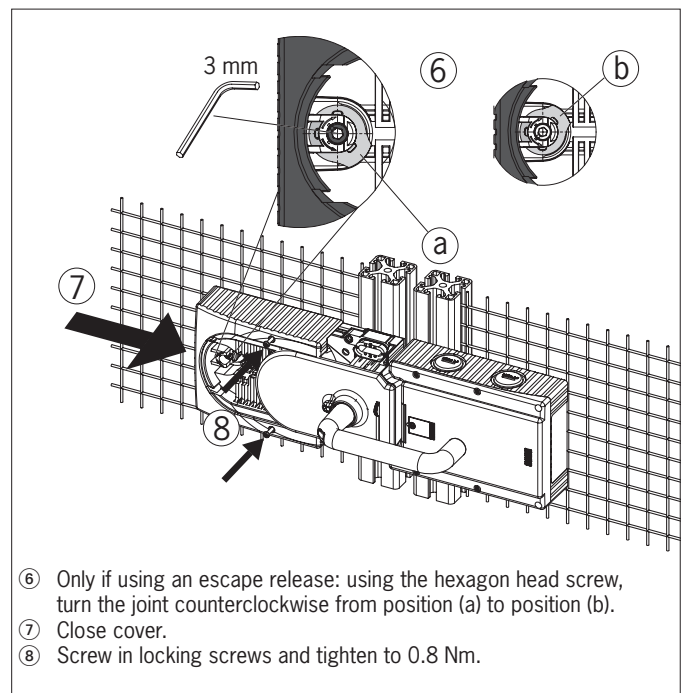


Figure 13: Changing actuating direction, steps ⑥ to ⑧

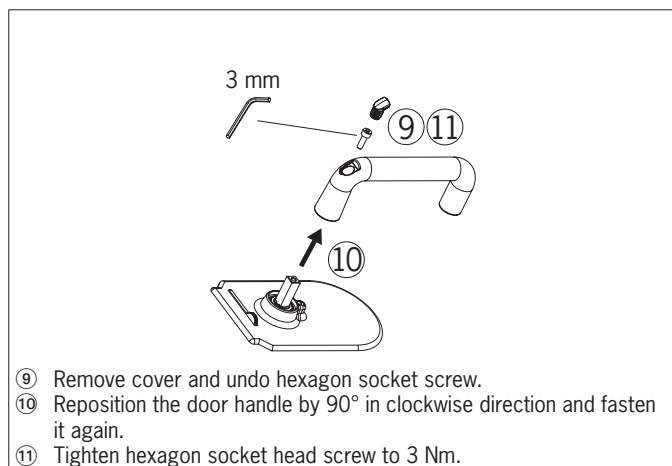


Figure 14: Changing actuating direction, steps ⑨ and ⑪

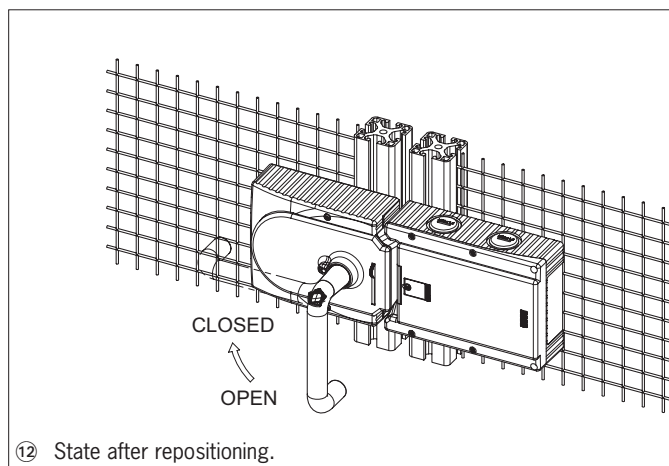


Figure 15: Changing actuating direction, final state

10. Protection against environmental effects

Lasting and correct safety function requires that the system must be protected against foreign bodies such as swarf, sand, blasting shot, etc., which can become lodged in the locking and handle modules. For this purpose a suitable installation position should be selected.

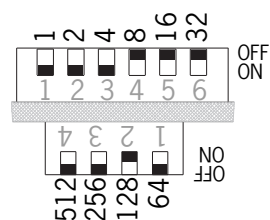
Cover device during painting work!

11. Controls and indicators

LEDs on the bus module

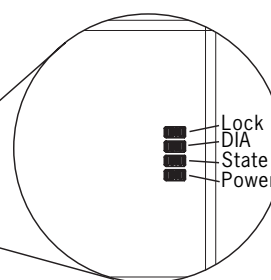
LED	Color	Description
Link 1 and Link 2	Green	Bus plug inserted: statically on
Data 1 and Data 2	Yellow	Data transfer: flashing
SF	Red	System error: statically on (see chapter on diagnostic messages of the MGB system)
BF	Red	Bus error: statically on (see chapter on diagnostic messages of the MGB system)
ON	Green	Self-test OK: statically on User passivated: flashing
UB	Green	Power supply OK: statically on

Binary coding of the DIP switches for PROFI-safe address (factory setting: 135)



default address:
 $128 + 4 + 2 + 1 = 135$

LEDs on locking/release module
see System status table



Cover for DIP switches

DIP switches for PROFI-safe address
For coding see above

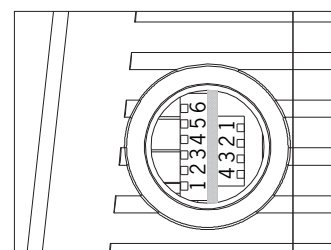


Figure 16: Indicators and controls/binary coding of the DIP switches for PROFI-safe address (factory setting: 135)

12. Electrical connection




WARNING

- In case of an error, loss of the safety function through incorrect connection.
- › Mounting must be performed only by authorized personnel.
 - › Lay the connection cables with protection to prevent the risk of short circuits.



CAUTION

- Risk of damage to equipment or malfunctions as a result of incorrect connection.
- › All the electrical connections must either be isolated from the mains supply by a safety transformer according to EN IEC 61558-2-6 with limited output voltage in the event of a fault, or by other equivalent isolation measures.
 - › Power devices which are a powerful source of interference must be installed in a separate location away from the input and output circuits for signal processing. The cable routing for safety circuits should be as far away as possible from the cables of the power circuits.
 - › In order to avoid EMC interference, follow EMC notes on devices in the immediate vicinity of the MGB system and their cables.
 - › In order to avoid EMC interference, the physical environmental and operating conditions at the installation site of the device must comply with the requirements according to the standard DIN EN 60204-1:2006, section 4.4.2/EMC.
 - › The function earth  must be connected. An M6 threaded bore is available on the mounting plate for this purpose.




Important!

- › The supply for further users on the bus may be forwarded via the Euchner MGB system. The entire supply current through the MGB must not be higher than specified in the chapter 17. *Technical data on page 34.*
- › If the device does not appear to function when operating voltage is applied (e.g. UB LED does not illuminate), the safety switch must be returned unopened to the manufacturer.
- › To ensure the stated degree of protection is achieved, the cover screws must be tightened to a tightening torque of 1 Nm.
- › Tighten screw for the cover for the mechanical release to 0.5 Nm.

12.1. Notes about



Important!

- › For use and operation as per the  requirements ¹⁾, a power supply with the feature “for use in class 2 circuits” must be used. The same requirement applies to the safety outputs. Alternative solutions must comply with the following requirements:
 - a) Electrically isolated power supply unit with a max. open-circuit voltage of 30 V/DC and a limited current of max. 8 A.
 - b) Electrically isolated power supply unit in combination with fuse as per UL248. This fuse should be designed for max. 3.3 A and should be integrated into the 30 V DC voltage section.
- › The mounting of conduits directly on the MGB is not allowed. Cables are only allowed to be connected via suitable cable glands. For this purpose use EUCHNER cable gland of type EKPM20/06U. Equivalent cable glands can be used if they are UL-listed (QCRV) and are suitable for the related cable diameter (22 AWG – 17 AWG).

1) Note on the scope of the UL approval: Only for applications as per NFPA 79 (Industrial Machinery).
The devices have been tested as per the requirements of UL508 (protection against electric shock and fire).

12.2. Connections on bus module

The bus module includes the PROFINET connections (X3 and X4) and the power supply connections (X1 and X2). Depending on the version, connection is made via push-pull plugs according to IEC 61076-3-117, variant 14 or 7/8" plugs according to ANSI/B93.55M-1981 and M12 plugs (d-coded) according to IEC 61076-3-101.

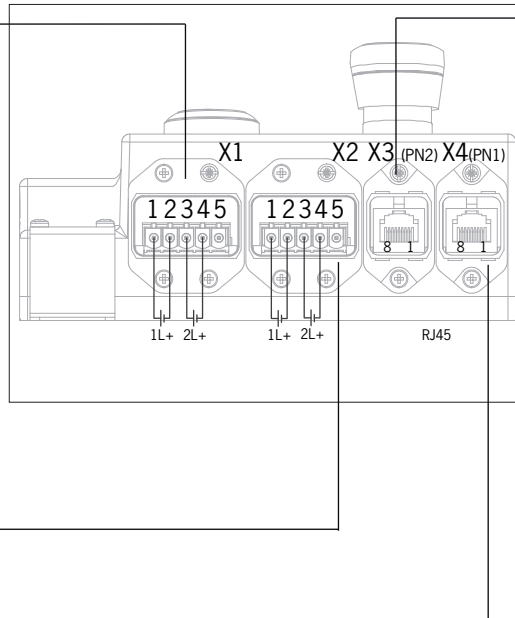
The bus module includes a PROFINET RT switch for Ethernet connection.

12.2.1. Terminal assignment for version with push-pull plugs

Pin	Description
X1.1	L1 operating voltage DC 24 V
X1.2	N1 operating voltage 0 V
X1.3	L2 auxiliary voltage* DC 24 V
X1.4	N2 auxiliary voltage* 0 V
X1.5	Function earth

* The auxiliary voltage is not required for the MGB system

Pin	Description
X2.1	L1 operating voltage DC 24 V
X2.2	N1 operating voltage 0 V
X2.3	L2 auxiliary voltage* DC 24 V
X2.4	N2 auxiliary voltage* 0 V
X2.5	Function earth



Pin	Description
X3.1	Receive Data RD+
X3.2	Receive Data RD-
X3.3	Transmit Data TD+
X3.4	n.c.
X3.5	n.c.
X3.6	Transmit Data TD-
X3.7	n.c.
X3.8	n.c.

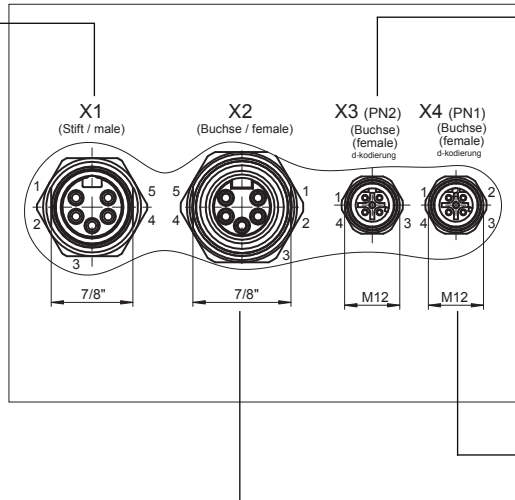
Pin	Description
X4.1	Receive Data RD+
X4.2	Receive Data RD-
X4.3	Transmit Data TD+
X4.4	n.c.
X4.5	n.c.
X4.6	Transmit Data TD-
X4.7	n.c.
X4.8	n.c.

12.2.2. Terminal assignment for version with 7/8" and M12 plugs, d-coded

Pin	Description
X1.1	N2 auxiliary voltage *0 V
X1.2	N1 operating voltage 0 V
X1.3	Function earth
X1.4	L1 operating voltage DC 24 V
X1.5	L2 auxiliary voltage* DC 24 V

* The auxiliary voltage is not required for the MGB system

Pin	Description
X2.1	N2 auxiliary voltage *0 V
X2.2	N1 operating voltage 0 V
X2.3	Function earth
X2.4	L1 operating voltage DC 24 V
X2.5	L2 auxiliary voltage* DC 24 V





Pin	Description
X3.1	Transmit Data +TD
X3.2	Receive Data +RD
X3.3	Transmit Data -TD_N
X3.4	Receive Data -RD_N
	Function earth on plug housing

Pin	Description
X4.1	Transmit Data +TD
X4.2	Receive Data +RD
X4.3	Transmit Data -TD_N
X4.4	Receive Data -RD_N
	Function earth on plug housing

13. Setup

13.1. Integrating into PROFINET and PROFIsafe

	<p>NOTICE</p> <p>The parameters "Update time" and "F-WD-Time" have a decisive effect on the reaction time of the safety function. The safety function could be lost if the reaction times are too long.</p>
	<p>Important!</p> <p>You will require the corresponding GSD file in GSDML format in order to integrate the MGB system:</p> <ul style="list-style-type: none"> ▸ GSDML-Vx.x-EUCHNER-MGB-PN_D_110026-JJMMTT.xml <p>You can find the GSD file in the download area at www.euchner.de.</p> <p>Prior to commissioning, the GSD file must be imported into the configuration software of the control system (see control system manual).</p>

You must perform the following steps to integrate the MGB system into PROFINET:

1. Configure the MGB system with the configuration software of the control system and assign parameters.

The following PROFINET parameters must be set:

- Device name (factory setting from GSD file): [euchnermgb].
- IP address: optionally fixed or dynamic
- Update time
 - Recommendation [32 ms]
 - Maximum value [128 ms]
 - (with number of repeat cycles = 3)

The following PROFIsafe parameters must be set:

- F_dest_adr (PROFIsafe address): this is generally assigned automatically by the control system.
- F_WD_Time (time during which the control system expects a response by the PROFIsafe device): [xxx ms]. Factory setting from GSD file: [600 ms]

2. Set the PROFIsafe address (F_dest_adr) on the MGB system using the DIP switches (see *Figure 16 on page 24*). Important: Identical addresses must be set in the control system and on the device.
3. Save the configuration and transfer it to the MGB system.

13.2. Replacement of an MGB system without programming device

If servicing is required, the MGB system is easy to replace with a new one. For this purpose, the following prerequisites must be met:

- The DIP switch settings (PROFIsafe address) on the new device must match those on the old device.
- Your Profinet master must support the automatic replacement of Profinet users.
- Your Profinet topology must be correctly configured.
- The replacement device must be connected to the same port as its predecessor.
- There must be no device name in the MGB system.
This field is empty in the as-delivered state. Systems that already contain a name must first be reset to the factory settings.

Once these conditions are met, simply replace the old system with the new system.

The Profinet bus does not need to be switched off for this purpose.

13.3. System reset to factory settings

You will find detailed instructions in the manual for the configuration software for your control system.

13.4. Teach-in operation (only for MGB unicode)

The handle module must be assigned to the locking module using a teach-in function before the system comprising locking module and handle module and forms a functional unit.

The system is in a safe state (bits SI 3, SI 4, SI 5, SI 9 and SI 10 are not set) during a teach-in operation.



Important!

- The locking module disables the code for the previous handle module if teach-in is carried out for a new handle module. Teach-in is not possible again immediately for this actuator if a new teach-in operation is carried out. The disabled code is deleted in the locking module only after a third code has been taught.
- The locking module can only be operated with the last handle module taught.
- If, in the teach-in standby state, the locking module detects the handle module taught-in or a disabled handle module, the teach-in standby state is ended immediately and the locking module changes to the normal state.
- If the bolt tongue is in the operating distance for less than 60 s, the handle module is not taught.

Teaching in handle module

1. Fit handle module.
2. Close safety guard. Check for correct alignment and distance using the marking on the locking module and re-adjust if necessary.
3. Insert bolt tongue in the locking module.
4. Apply operating voltage to the locking module.
- ➔ Teach-in operation starts, green LED (State) flashes slowly (approx. 1 Hz). The teach-in standby state is active for 3 minutes after switch on. During teach-in, the locking module checks whether the handle module is a disabled handle module. Provided this is not the case, the teach-in operation is ended after approx. 60 seconds, and the green LED (State) goes out. The new code has now been stored, and the old code is disabled.
5. Reset via bit O 18 in the data block of the diagnostic function to activate the taught-in code of the handle module in the locking module.

13.5. Mechanical function test

It must be possible to easily insert the bolt tongue in the locking module. To check, close safety guard several times and actuate door handle.

If available, check function of the escape release. With active guard locking it must be possible to operate the escape release from the inside without excessive effort (approx. 40 N).

13.6. Electrical function test

1. Switch the operating voltage on or perform a reset via output bit O 18 in the data block of the diagnostic function.
2. Close all safety guards and insert the bolt tongue into the locking module.
In case of guard locking by solenoid force ➔ activate guard locking.
 - The machine must not start automatically.
 - It must not be possible to open the safety guard.
 - **The following applies to MGB-L0:** The green LED (State) is illuminated.
 - **The following applies to MGB-L1/2:** The green LED (State) and the yellow LED (Lock) are illuminated.
3. Enable operation in the control system.
 - It must not be possible to deactivate guard locking as long as operation is enabled.
4. Disable operation in the control system and deactivate guard locking.
 - The safety guard must remain locked until there is no longer any risk of injury.
 - It must not be possible to start the machine as long as the guard locking is deactivated.
 - It must be possible to open the safety guard.

Repeat steps 2-4 for each safety guard.

13.7. PROFINET data bytes (data blocks for unsafe functions)



NOTICE

- See the supplied data sheet for details on the bit assignment.
- See chapter 14. *Diagnostic messages of the MGB system on page 31.*

Profinet RT modules 3 bytes IO:

Assignment in the input area of the bus master:

1st byte	I 8	I 7	I 6	I 5	I 4	I 3	I 2	I 1
2nd byte	I 16	I 15	I 14	I 13	I 12	I 11	I 10	I 9
Depending on your configuration variant (refer to the data sheet of your device for the exact bit allocation)								

Assignment in output area of the bus master:

1st byte	O 8	O 7	O 6	O 5	O 4	O 3	O 2	O 1
2nd byte	O 16	O 15	O 14	O 13	O 12	O 11	O 10	O 9
Depending on your configuration variant (refer to the data sheet of your device for the exact bit allocation)								

3rd byte	I 24	I 23	I 22	I 21	I 20	I 19	I 18	I 17
----------	------	------	------	------	------	------	------	------

- I 17:
- Device diagnosis (PROFIsafe error 72): message present. Diagnostic code: see table of device-specific messages.
- I 18:
- Device diagnosis, device-specific message 274(4) "Plausibility check found an error (e.g. escape release actuated)"
- I 19:
- Device diagnosis, device-specific message 272(1) or 273(1) "Error in emergency stop"
- I 20:
- Device diagnosis, device-specific message 272(2) or 273(2) "Error in enabling switch"
- I 21:
- Device diagnosis, device-specific message 272(6) or 273(6) "Error in operating mode selector switch"
- I 22:
- n.c.
- I 23:
- n.c.
- I 24:
- Mechanical life > 1 million operating cycles

3rd byte	O 24	O 23	O 22	O 21	O 20	O 19	O 18	O 17
----------	------	------	------	------	------	------	------	------

- O 17:
- Device diagnosis: acknowledge message; acknowledgment of I 19, I 20 or I 21. I 17 is also acknowledged if only one message is present.
- O 18:
- Trigger MGB locking module reset: acknowledge message; acknowledgment of I 18. I 17 is also acknowledged if only one message is present.
- O 19:
- n.c.
- O 20:
- n.c.
- O 21:
- n.c.
- O 22:
- n.c.
- O 23:
- n.c.
- O 24:
- n.c.

13.8. PROFIsafe data bytes (data block for safe functions)

Safe PROFIsafe data are transmitted in addition to the non-safety-related PROFINET data. These data include all information about the door position and guard locking, emergency stop and enabling switch, for example.



NOTICE

▸ See the supplied data sheet for details on the bit assignment.



Important!

Never use the signaling bits for safety functions.

Profisafe assignment in the output area of the bus master:

Byte n+0	SO 8	SO 7	SO 6	SO 5	SO 4	SO 3	SO 2	SO 1
Byte n+1	SO 16	SO 15	SO 14	SO 13	SO 12	SO 11	SO 10	SO 9
Byte n+2	Profisafe internal							
Byte n+3	Profisafe internal							
Byte n+4	Profisafe internal							
Byte n+5	Profisafe internal							

SO 1: Control of guard locking solenoid (for function, see section on *control of guard locking*, p. 6, only available for L1 and L2)

SO 2: n.c

SO 3: n.c

SO 4: n.c

SO 5: n.c

SO 6: n.c

SO 7: n.c

SO 8: n.c

SO 9: n.c

SO 10: n.c

SO 11: n.c

SO 12: n.c

SO 13: n.c

SO 14: n.c

SO 15: n.c

SO 16: n.c

Profisafe assignment in the input area of the bus master:

Byte n+0	SI 8	SI 7	SI 6	SI 5	SI 4	SI 3	SI 2	SI 1
Byte n+1	SI 16	SI 15	SI 14	SI 13	SI 12	SI 11	SI 10	SI 9
Byte n+2	Profisafe internal							
Byte n+3	Profisafe internal							
Byte n+4	Profisafe internal							
Byte n+5	Profisafe internal							

SI 1: Emergency stop

SI 2: Enabling switch
Enabling contacts closed (three-stage enabling switch in center position), no evaluation of the edges

SI 3: Door position (T)

SI 4: Bolt position (R)

SI 5: Guard locking (Z)

SI 6:

SI 7: Operating mode selector switch (used, 3 bits)

SI 8:

SI 9: SK (T **AND** R)
Door position + bolt position (available for L0, L1 and L2)

SI 10: ÜK (T **AND** R **AND** Z)
Door position + bolt position + guard locking (available only for L1 and L2)

SI 11: n.c

SI 12: n.c

SI 13: n.c

SI 14: n.c

SI 15: n.c

SI 16: Reserved for customer-specific function

14. Diagnostic messages of the MGB system

All diagnostic messages are listed below. The scope of the possible messages can differ according to the MGB system version.

PROFIsafe messages

Display via LED BF (see Figure 16)

No.	Description	Measures/remedying errors
64	Error when comparing the PROFIsafe destination address (F_Dest_Add)	1. Check DIP switch setting 2. Restart system
65	Invalid PROFIsafe destination address (F_Dest_Add)	1. Check addressing 2. Restart system
66	Invalid PROFIsafe source address (F_Source_Add)	1. Check addressing 2. Restart system
67	Value for the PROFIsafe time monitoring is 0 ms (F_WD_TIME)	1. Check system times 2. Restart system
68	Parameter F_SIL exceeds SIL of the device-specific application	1. Check settings 2. Restart system
69	Parameter F_CRC_Length does not match the generated values	1. Check settings 2. Restart system
70	Version for F_Parameter not correct	1. Check configuration 2. Restart system
71	Error CRC 1- (during booting)	1. Restart system
72	Device-specific diagnostic information (see following table)	1. Identify error via input bit I 17 2. For error remedy, see the following table with device-specific messages

Device-specific diagnostic information

Display via LED SF (see Figure 16)

Discrepancy error (two-channel monitoring detected an error)

Notice:

- The discrepancy time is the maximum time during which channel 1 and channel 2 may have different signal states.
- If acknowledgment was unsuccessful, send the device to the manufacturer.

No.	Description	Measures/remedying errors
272	Discrepancy time exceeded	1. Search for cause 2. Acknowledge fault (via output bit O 17)
272(1)	Emergency-stop discrepancy time exceeded	1. Press emergency stop 2. Acknowledge fault (via output bit O 17)
272(3)	Door position discrepancy time exceeded	1. Open the door 2. Acknowledge fault (via output bit O 17)
272(4)	Bolt-position discrepancy time exceeded	1. Open the door 2. Acknowledge fault (via output bit O 17)
272(5)	Guard-locking discrepancy time exceeded	1. Open the door 2. Acknowledge fault (via output bit O 17)
272(6)	Operating mode selector switch discrepancy time exceeded	1. Search for cause 2. Acknowledge fault (via output bit O 17)
272(7)	Enabling switch detection discrepancy time exceeded	1. Remove enabling switch 2. Acknowledge fault (via output bit O 17)
272(8)	Internal device error	Please contact our support organization!

Test-pulse error (short-circuit monitoring detected an error)

Notice:

- The emergency stop must **not** be pressed during acknowledgment.
- If acknowledgment was unsuccessful, send the device to the manufacturer.

No.	Description	Measures/remedying errors
273	Test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Check system 2. Acknowledgment via output bit O 17 required.
273(1)	Emergency-stop test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Check system 2. Acknowledgment via output bit O 17 required.
273(3)	Door-position test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Close door 2. Acknowledgment via output bit O 17 required.
273(4)	Bolt-position test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Close door 2. Acknowledgment via output bit O 17 required.
273(5)	Guard-locking test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Close and lock door 2. Acknowledgment via output bit O 17 required.
273(6)	Operating mode selector switch test pulses erroneous.	Safety function is switched off while no test pulses are being detected. 1. Check system 2. Acknowledgment via output bit O 17 required.
273(7)	Enabling-switch detection test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Check system 2. Acknowledgment via output bit O 17 required.
273(8)	Internal device error	Please contact our support organization!

General messages of the overall system

No.	Description	Measures/remedying errors
274(2)	Internal device error	Please contact our support organization!
274(3)	Signal sequence erroneous (e.g. broken bolt tongue recognized)	1. Check mech. functions 2. Acknowledge fault (via output bit 0 18). The safety door must be open.
274(4)	Plausibility test detected an error (e.g. escape release actuated)	Important: The resetting procedure is contained in the section "Latching fault when actuating the escape release" ► Acknowledge fault (via output bit 0 18)
274(5)	Locking module in error	Please contact our support organization!
274(6)	Internal device error	Please contact our support organization!
274(7)	Internal device error	
274(8)	Internal device error	

Fault in operating mode selector switch

No.	Description	Measures/remedying errors
275(1)	Plausibility check erroneous	Please contact our support organization!
275(2)	Internal device error	
275(3)	Internal device error	
275(4)	Internal device error	
275(5)	Internal device error	
275(6)	Internal device error	
275(7)	Internal device error	
275(8)	Internal device error	

PROFIsafe errors

No.	Description	Measures/remedying errors
276(1)	Starting error PROFIsafe	Please contact our support organization!
276(2)	Memory error RAM	
276(3)	Memory error FLASH	
276(4)	Communication error	
276(5)	Synchronization error	
276(6)	Voltage monitoring	
276(7)	Internal device error	
276(8)	Hardware fault	

General messages of the overall system

No.	Description	Measures/remedying errors
277(1)	Starting error MGB	Please contact our support organization!
277(2)	Communication error	
277(3)	Internal device error	
277(4)	Wrong software version	
277(5)	Internal device error	
277(6)	Internal device error	
277(7)	Internal device error	
277(8)	Internal device error	

No.	Description	Measures/remedying errors
278(1)	Solenoid control fault	Please contact our support organization!
278(2)	Fault in switch element CPU A	
278(3)	Fault in switch element CPU B	
278(4)	Timeout of switch element CPU A	
278(5)	Timeout of switch element CPU B	
278(6)	Internal device error	
278(7)	Internal device error	
278(8)	Internal device error	

Cyclical Profisafe status message

Bit	Description	Measures/remedying errors
0	Reserved	-
1	Error in F-Device or F-Module	User is passivated (on LED flashes). You will find information on depassivating in the manual for your control system.
2	Communication error, CRC error	
3	Communication error, watchdog timeout	-
4	Fail-safe values activated	-
5	Toggle bit	-
6	Consecutive number was reset	-
7	Reserved	-

15. PROFINET alarms

15.1. Fault in stacklight module

Short circuits on the stacklight module are output as a PROFINET diagnostic alarm (alarm number 1: short circuit).

16. System status table

LEDs on interlocking/locking module

Operating mode	Door position	Position of the bolt tongue	Guard locking	Door position input bit SI 3	Bolt position input bit SI 4	Guard locking input bits 5	UK input bit SI 10	Device diagnostics input bit I 17	Device diagnostics input bit I 18	Device diagnostics input bit I 24	POWER (gn)	LED indicator			State	
												STATE (gn)	Lock (ye), only MGB-L1/-L2	DIA (rd)		
Normal operation	open	not in- serted	off	off	off	off	off	off	off	X		long OFF short ON	○	○	Normal operation, door open	
	closed	not in- serted	off	on	off	off	off	off	off	X		long ON short OFF	○	○	Normal operation, door closed	
	closed	inserted	off	on	off	off	off	off	off	X			long ON short OFF	○	Normal operation, door closed, bolt tongue inserted	
	closed	inserted	on	on	on	on	on	off	off	X				○	Normal operation, door closed and locked	
Teach-in standby (only for MGB unit-code)	open	not in- serted	off	off	off	off	off	off	off	X		3 x	○	○	Door open; unit is ready for teach-in for another handle module (only short time after power-up)	
	closed	inserted	on	off	on	on	off	off	off	X		1 Hz	○	○	Teach-in operation	
Setup (only for MGB unit-code)	X	X	X	off	off	off	off	off	off	X		○	○	○	Positive acknowledgment after completion of teach-in operation	
	X	X	X	off	off	off	off	on	off	X		3 x	○		Handle module read error (e.g. error in code or code cannot be read)**	
Fault display	X	X	X	off	off	off	off	on	off	X		○	○	☀	Internal fault (e.g. component faulty, data error)*	
	X	X	X	off	off	off	off	on	off	X		○	☀	1 x	Signal sequence incorrect, e.g. broken bolt tongue recognized *** or after actuation of the escape release, for example*	
Key to symbols	○															LED not illuminated
	☀															LED illuminated
	☀ 10 Hz (8 s)															LED flashes for 8 seconds at 10 Hz
	☀ 3 x															LED flashes three times
	X															Any state

* Latching fault; use corresponding output bit to reset (see chapter 14. Diagnostic messages of the MGB system on page 31)

** Non-latching fault; open safety guard and close it again to reset

*** Latching fault; use corresponding output bit to reset; door must be open (see chapter 14. Diagnostic messages of the MGB system on page 31)

Important: If you do not find the displayed device status in the System status table, this indicates an internal device fault. In this case, you should contact the manufacturer.

17. Technical data



NOTICE

If a product data sheet is included with the product, the information on the data sheet applies.

Parameter	Value
s _{ar} max. door position	65 mm
Housing material	Fiber glass reinforced plastic; die-cast zinc, nickel-plated; stainless steel; powder-coated sheet steel
Dimensions	See dimension drawing
Weight of MGB-L.B (bus module, locking module, and button module with mounting plate)	4.05 kg
Weight of handle module with mounting plate	1.20 kg
Weight of escape release module with mounting plate	1.15 kg
Ambient temperature	-20 ... +55 °C
Degree of protection	IP 54
Safety class	III
Degree of contamination	3
Installation position	Any
Locking force F _{zh} in accordance with GS-ET-19	2,000 N
Connection options, power supply	2 x push-pull power ¹⁾ or 2 x plug connectors 7/8" according to ANSI/B93.55M-1981
Connection type, bus	2 x RJ 45, push-pull, according to IEC 61076-3-117 type 14, screened ¹⁾ or 2 x M12 (d-coded) according to IEC 61076-2-101
Connection cable, bus	Profinet I/O cable, at least cat. 5e
Operating voltage U _B	DC 24 V +10% / -15% (PELV – see chapter 12. <i>Electrical connection on page 25</i>)
Current consumption, max.	500 mA
Max. feed-in current in the connection block (push-pull plug connector)	4,000 mA
Fuse protection for power supply, external	Min. 1 A slow-blow
Safety outputs	Profisafe according to IEC 61784-3-3
Rated insulation voltage U _i	75 V
Rated impulse withstand voltage U _{imp}	0.5 kV
Resilience to vibration and shock	According to EN 60947-5-3
EMC protection requirements	According to EN 61000-4 and DIN EN 61326-3-1
Switching frequency max.	1 Hz
Risk times max. (switch-off times) ²⁾	
- Emergency stop	220 ms
- Enabling switch	220 ms
- Operating mode selector switch	220 ms
- Door position	550 ms
- Bolt position	550 ms
- Guard locking	550 ms
Reliability values acc. to EN ISO 13849-1	
Category	4 (EN 13849-1:2008-12)
Performance Level	PL e (EN 13849-1:2008-12)
MTTF _d ³⁾	91 years
DC	99%
Mission time	20 years
PFH _d ³⁾	
- Monitoring of guard locking	4.07 x 10 ⁻⁸
- Control of guard locking	3.91 x 10 ⁻⁸
- Evaluation of emergency stop, enabling switch, selector switch	4.10 x 10 ⁻⁸
B _{10d} ⁴⁾	
- Emergency stop	1 x 10 ⁵
- Enabling switch	According to manufacturer's specifications

1) The document *PROFINET Cabling and Interconnection Technology* from the PNO aids in the correct selection of wiring.

2) The risk time is the max. time between the change in the input status and the deletion of the corresponding bit in the bus protocol.

3) Fixed failure rate without consideration of faults in wearing parts.







4) Information regarding wearing parts without consideration of fixed failure rates in electronic components.

18. Troubleshooting and assistance

18.1. Latching fault when actuating the escape release

In order to achieve monitoring of the locking device in category 4, PL e according to EN ISO 13849-1, an internal monitoring logic system is integrated into every locking module.

Result: The MGB system enters into a latching fault when the escape release is actuated (refer to the 16. System status table on page 33).

Door position	Position of the bolt tongue	Guard locking	Door position input bit SI 3	Bolt position input bit SI 4	Guard locking input bit SI 5	UK input bit SI 10	Device diagnostics input bit I 17	Device diagnostics input bit I 18	Device diagnostics input bit I 24	LED indicator				State	
										Power (gn)	State (gn)	Lock (ye)	DIA (rd)		
X	X	X	off	off	off	off	on	on	X		○		1 x		Signal sequence incorrect (e.g. after actuation of the escape release)*
○															LED not illuminated
															LED illuminated
 10 Hz (8 s)															LED flashes for 8 seconds at 10 Hz
 3 x															LED flashes three times
X															Any state



NOTICE

The system might not enter into a latching fault if the escape release is actuated very slowly.

18.2. Fault reset

Proceed as follows:

1. Acknowledge fault via output bit ○ 18 (in data block for diagnostics function).
 2. Close safety guard if necessary and switch guard locking on.
- ➡ The system is in normal mode again.

18.3. Help on troubleshooting on the Internet

You will find a help file on troubleshooting under "Support" in the service area at www.euchner.de.

18.4. Help on mounting on the Internet

You will find an animation on the mounting process at www.euchner.de.

18.5. Application examples

You will find application examples on connecting the device to various control systems at www.euchner.de.

19. Service

If service support is required, please contact:

EUCHNER GmbH + Co. KG
Kohlhammerstraße 16
D-70771 Leinfelden-Echterdingen

Service telephone:

+49 711 7597-500

E-mail:

support@euchner.de

Internet:

www.euchner.de

20. Inspection and service



WARNING

Loss of the safety function because of damage to the system.
In case of damage, the affected module must be replaced completely. Only accessories or spare parts that can be ordered from EUCHNER may be replaced.

Regular inspection of the following is necessary to ensure trouble-free long-term operation:

- › Check the switching function (see section 13.6. *Electrical function test on page 28*)
- › Check the secure fastening of the devices and the connections
- › Check for soiling

No servicing is required; repairs to the device are only allowed to be made by the manufacturer.



NOTICE

The year of manufacture can be seen in the lower right corner of the rating plate.

21. Declaration of conformity

More than safety.



EUCHNER

EUCHNER GmbH + Co. KG
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Germany

EG-Konformitätserklärung
EC-Declaration of Conformity
CE-Déclaration de Conformité
CE-Dichiarazione di conformità
CE-Declaración de conformidad

Original DE
Translation EN
Traduction FR
Traduzione IT
Traducción ES

123624-02-02/15

Die nachfolgend aufgeführten Produkte sind konform mit den Anforderungen der folgenden Richtlinien (falls zutreffend):
The beneath listed products are in conformity with the requirements of the following directives (if applicable):
Les produits mentionnés ci-dessous sont conformes aux exigences imposées par les directives suivantes (si valable)
I prodotti sotto elencati sono conformi alle direttive sotto riportate (dove applicabili):
Los productos listados a continuación son conforme a los requisitos de las siguientes directivas (si fueran aplicables):

I:	2006/42/EG	Maschinenrichtlinie
	2006/42/EC	Machinery directive
	2006/42/CE	Directive Machines
	2006/42/CE	Direttiva Macchine
	2006/42/CE	Directiva de máquinas

Die Schutzziele der Niederspannungsrichtlinie wurden gemäß Anhang I, Nr. 1.5.1 der Maschinenrichtlinie eingehalten.
The safety objectives of the Low-Voltage Directive comply with Annex I, No. 1.5.1 of the Machinery Directive.
Les objectifs de sécurité de la Directive Basse Tension sont conformes à l'annexe I, No. 1.5.1 de la Directive Machines
Gli obiettivi di sicurezza della Direttiva Bassa Tensione sono conformi a quanto riportato all'allegato I, No. 1.5.1 della Direttiva Macchine.
Los objetivos de seguridad de la Directiva de Bajo Voltaje cumplen con el Anexo I, No. 1.5.1 de la Directiva de Máquinas

Folgende Normen sind angewandt:
Following standards are used:
Les normes suivantes sont appliquées:
Vengono applicate le seguenti norme:
Se utilizan los siguientes estándares:

a:	EN 60947-5-3:1999/A1:2005
b:	EN ISO 14119:2013
c:	EN ISO 13849-1:2008
d:	EN 61784-3-3:2008 (Profisafe)
e:	EN 60947-5-5:1997/A1:2005

Bezeichnung der Bauteile Description of components Description des composants Descrizione dei componenti Descripción de componentes	Type Type Type Tipo	Richtlinie Directives Directive Direttiva Directivas	Normen Standards Normes Norme Estándares	Zertifikats-Nr. No. of certificate Numéro du certificat Numero del certificato Número del certificado
Sicherheitsschalter Safety Switches Interrupteurs de sécurité Fin corsa di sicurezza Interruptores de seguridad	MGB...PN ...	I	a, b, c, d	Z10 10 04 40393 008
	MGB-B...PN...	I	c, d	Z10 10 04 40393 008
	MGB-CB...PN...	I	c, d	Z10 10 04 40393 008
Sicherheitsschalter mit Not-Halt-Einrichtungen Safety Switches with Emergency-Stop facilities Interrupteurs de sécurité avec appareillage arrêt d'urgence Fin corsa di sicurezza con dispositivi di arresto di emergenza Interruptores de seguridad con dispositivos de parada de emergencia	MGB...PN ...	I	a, b, c, d, e	Z10 10 04 40393 008
	MGB-B...PN...	I	c, d, e	Z10 10 04 40393 008
	MGB-CB...PN...	I	c, d, e	Z10 10 04 40393 008

Benannte Stelle
Notified Body
Organisme notifié
Sede indicata
Entidad citada

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